

FINAL ENVIRONMENTAL ASSESSMENT**Adopting the Draft EA & Responding to Comments**

**Seven-Up Pete Joint Venture
McDonald Gold Exploration Project
Exploration License No. 00497**

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HELENA, MONTANA 59620**1997 Hydrologic Field Investigations*****Prepared by:*****The Montana Department of Environmental Quality*****and*****The Montana Department of Natural Resources & Conservation*****Pursuant to:*****The Montana Environmental Policy Act**

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June 1997

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DEPARTMENT OF ENVIRONMENTAL QUALITY
PERMITTING AND COMPLIANCE DIVISION



MARC RACICOT, GOVERNOR

1520 EAST SIXTH AVENUE

STATE OF MONTANA

(406) 444-4323

PO BOX 200901
HELENA, MONTANA 59620-0901

June 16, 1997

Dear Reader:

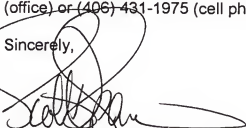
On February 26, 1997, the Montana Department of Environmental Quality (DEQ) and the Montana Department of Natural Resources & Conservation (DNRC) received an application from the Seven-Up Pete Joint Venture (SPJV) to conduct another round of hydrological (pump) tests this summer at its McDonald Gold Project area under authority of Exploration License No. 00497. The project area is located approximately 8 miles east of Lincoln, Montana, in Lewis & Clark County. The SPJV also requested three groundwater mixing zones from DEQ under *ARM 17.30.501 et seq. (Water Quality Rules & Regulations - Mixing Zones)*. The agencies evaluated the proposal and associated data, and subsequently published and released a Draft Environmental Assessment (EA) on May 9, 1997. A public comment period followed through June 9, 1997. In addition, the agencies held two public hearings on the pump test proposal to gather oral comments. The meetings were held in Lincoln, Montana on Tuesday, May 20, 1997, and in Missoula, Montana on Wednesday, May 21, 1997.

The agencies received 118 written comments and 10 oral comments on the pump test proposal. Although some of the comments required clarification, none changed the analysis or conclusions outlined in the Draft EA. Therefore, **the Draft EA has been formally adopted by reference as the Final EA, with the addition of this document and its discussions, clarifications, responses and errata sheet.**

Enclosed for your review are the agencies' responses to the comments received on the proposal and on the Draft EA.

Thank you for your time and consideration. Please call me at (406) 444-4955 (office) or (406) 431-1975 (cell phone) if you have any questions.

Sincerely,



Scott D. Spano, Supervisor
Hard Rock & Placer Exploration Section
Permitting & Compliance Division

Enclosure



Comment Summary & Agency Responses

Introduction

On February 26, 1997, the Montana Department of Environmental Quality (DEQ) and the Montana Department of Natural Resources & Conservation (DNRC) received an application from the Seven-Up Pete Joint Venture (SPJV) to conduct another round of hydrological (pump) tests this summer at its McDonald Gold Project area under authority of Exploration License No. 00497. The project area is located approximately 8 miles east of Lincoln, Montana, in Lewis & Clark County. The SPJV is also requesting three groundwater mixing zones from DEQ under ARM 17.30.501 *et seq.* (*Water Quality Rules & Regulations - Mixing Zones*). The agencies evaluated the proposal and associated data, and subsequently published and released a Draft Environmental Assessment (EA) on May 9, 1997. A public comment period followed through June 9, 1997. In addition, the agencies held two public hearings on the pump test proposal to gather oral comments. The meetings were held in Lincoln, Montana on Tuesday, May 20, 1997, and in Missoula, Montana on Wednesday, May 21, 1997.

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Purpose of Comment Period

The purpose of the comment period and hearings was to gather written and oral comments specifically related to the proposed pump tests and Environmental Assessment (EA). Under the *Montana Environmental Policy Act* (§ 75-1-101 *et seq.* MCA) (MEPA), the agencies are required to consider public comments when deciding on proposed actions, but are not required to directly respond to comments generated by an EA (ARM 17.4.610(5)). However, due to the amount of public interest generated by the proposed pump tests, the agencies are publishing responses to comments received on this proposal.



General Discussion on Comments

Many of the comments received were *not* directly related to the proposal or its analysis in the EA, but were in the form of opinions regarding such things as: the mining industry in general, the uses of gold, the company's environmental record in other states, the success history of heap leach facilities, environmental impacts of other Montana mines, the nationality of miners, the concept of mixing zones, the 1995 Legislative changes to the *Montana Water Quality Act*, and the qualifications of the Hard Rock Program's technical staff. These comments have not been responded to; the agencies have responded to substantive questions or comments regarding the technical analysis of the company's proposal in the EA. For example, if an individual questioned the conclusions made by the agencies based upon the analysis of the proposal and associated data, a response would certainly be appropriate. Similarly, if a person asks a specific question regarding the legality of a proposed action, a response would be warranted. However, it would *not* be appropriate for the agencies to enter into discussions on matters of an individual's personal opinion related to topics such as those mentioned above. Therefore, no responses have been given to these types of comments.

Another comment regards a perceived lack of responsiveness by the agencies to comments given during past public hearings on EAs for pump tests that were proposed in previous years. A review of the files indicates that all substantive comments were responded to by agency staff. As stated above, the agencies have *not* responded to comments that are not pertinent to the technical analysis of the proposed pump tests in the EA.

Some concern was raised about DEQ's distribution list for this EA. Individuals who had attended hearings on previous pump test EAs, and had submitted their names and addresses for inclusion on the mailing list, did not receive the EA. The applicable mailing list was accidentally combined with a very large general mailing list (>6,000) during the confusion associated with a prolonged vacancy in administrative support staff. When this error was discovered, an attempt was made to use the large list and select addresses from the Blackfoot Valley, Helena, and Missoula, and for the various environmental organizations, to form a base for a new project-specific mailing list. In order to ensure availability of the EA to individuals not on the new list, press releases were sent to the *Helena Independent Record*, the *Missoulian*, and the *Blackfoot Valley Dispatch*, which included information on how to receive a copy of the EA by mail. In addition, the entire content of the EA was placed on the DEQ's Internet home page. We sincerely apologize to those who were inconvenienced by our mistake.

It appears that many people who submitted comments are confused about what specifically is being proposed. Many comments were received that spoke of the *existing* mine, *cyanide discharges* and *cyanide heap leach facilities*. No mine or mining disturbances exist at the site. The SPJV submitted an application for an Operating

(mining) Permit in November of 1994. The application has undergone several agency reviews and public scoping meetings, and the agencies are now in the process of preparing a Draft Environmental Impact Statement (EIS) on the proposed mine that will not be released for several more months. After the Draft EIS is released, a lengthy comment period, including public hearings, will follow. Following the comment period, a Final EIS will be prepared and released. After the release of the Final EIS, the agencies will prepare joint or separate Records of Decision which will outline the agencies' decisions on the proposed mine.

The plan of operations analyzed in this EA contains proposals to conduct pump tests and to establish associated mixing zones under SPJV's Exploration License. The proposed mixing zones are *not* for the proposed mine. The SPJV has not yet applied for mixing zones that would be associated with its proposed mine, but will likely do so at a future date. The currently-proposed mixing zones are *not* for cyanide, as some commenters appear to believe. In fact, there is no cyanide located at the McDonald Gold Project exploration site, nor would there be during the proposed tests. Since an Operating (mining) Permit has *not* been issued, there are also no heap leach facilities located at the site.

Many commenters mistakenly spoke of a proposed discharge into the Blackfoot and Landers Fork Rivers, a potential for metal accumulation on the river bottoms, and a potential for metal toxicity of fish and aquatic organisms. No discharge to surface waters is proposed. Water would be pumped from deep bedrock aquifers and discharged into the alluvial (shallow) aquifer via three infiltration trenches. The analysis by the agencies, as discussed in the EA, concludes that no groundwater flow paths exist that would allow the water discharged to the alluvial aquifer to migrate to gaining reaches of either of these two (or any other) streams. In addition, even though the water discharged into the alluvial aquifer would not enter any surface water, the trace metal concentrations of the discharge itself (even *before* dilution in the groundwater) are below the aquatic life standards that affect fish and aquatic organisms.

A few commenters appeared to be under the impression that mixing zones constitute a violation of water quality regulations, and that mining and exploration projects are unique in their use of mixing zones. This impression is incorrect. Regardless of how one feels about mixing zones, they are allowed under the *Montana Water Quality Act & Implementing Rules (75-5-301, MCA, and ARM 17.30.501 through 518)* and are currently in widespread use. SPJV is applying for *groundwater* mixing zones. Many types of entities apply for and receive *groundwater or surface water* mixing zones. Among the most common users of surface water mixing zones are municipal sewage treatment facilities. In addition, all individual septic systems basically employ the concept of a groundwater mixing zone.

Many commenters mentioned that about 108 pounds of arsenic would be added to the alluvial aquifer *over the proposed 6-month pumping period*. The actual amount is likely

to be somewhat less. However, assuming this figure is accurate, it must be placed into perspective. First of all, the existing deep bedrock groundwater containing arsenic and other dissolved metals eventually reaches the alluvial aquifer anyway under existing natural conditions, albeit at a rate approximately 5½ times slower than the proposed pumping rate.

Secondly, although many people are unaware of it, Montana's rivers, lakes, streams and groundwater contain naturally-occurring arsenic. For example, the average **daily** load of arsenic on the Madison River near Norris is 2,003 pounds (or 360,540 pounds over a 6-month period); for the Missouri River at Toston, the amount is 1,913 pounds per day (or 344,340 pounds over a 6-month period); for the Kootenai River below Libby Dam, the daily load is 127 pounds (or 22,860 pounds over a 6-month period); for Rock Creek at its mouth near Clinton, the amount is 9 pounds per day (or 1,620 pounds over a 6-month period); for the Musselshell River near Roundup, the amount is 423 pounds per day (or 76,140 pounds over a 6-month period); and for the Blackfoot River just before its confluence with the Clark Fork River, the daily load is about 155 pounds (or 27,900 pounds over a 6-month period)¹. So when viewed in perspective, an additional 108 pounds of arsenic over the 6-month period is not a significant increase over natural background levels.

Finally, several commenters were concerned about human toxicity from arsenic within the mixing zone. Under the state water quality regulations governing mixing zones, such zones cannot include areas that contain domestic wells. As such, no domestic wells are located within the proposed mixing zones. The only wells located within the proposed mixing zones are monitoring wells installed by the SPJV. It should be noted that Montana's municipal water systems are held to an arsenic standard of 0.050 milligrams per liter (mg/L), which is the federal Maximum Contaminant Limit (MCL) allowable for public drinking water supplies. This is the maximum concentration allowed in the water that many Montanans drink. The maximum arsenic concentration that would be discharged into the alluvial aquifer at the infiltration trenches - *prior to dilution in the mixing zone* - is 0.038 mg/L, which is lower than the standard used for drinking water systems. The arsenic concentration at the end of the mixing zones is expected to be between 0.004 and 0.006 mg/L. As you can see, at no time is the arsenic level higher than the standard allowed for municipal drinking water systems - either *before* or *after* dilution in the mixing zone.

Specific Responses

The following are specific responses to comments received on SPJV's proposal and the Environmental Assessment (EA):

- 1) Comment:** The proposed discharge will not meet standards, and arsenic is of particular concern. If the standards are violated in the deep aquifer,

¹Source: U.S. Geological Survey, Water Resources Data, Montana (1993 or most recent USGS data available)

why wouldn't the pumping transfer that violation to the surface aquifer?

Response: The analysis in the EA shows that all metals including arsenic would meet standards at the end of the mixing zone. Water quality standards can be exceeded within a designated mixing zone (ARM 17.30.502).

2) **Comment:** Nitrates will exceed standards.

Response: No elevated nitrates have been detected in the groundwater and would not be present in the pump test discharge. However, nitrates will be an issue for the proposed mine and the impacts from nitrates will be evaluated in the EIS for the McDonald Gold Project.

3) **Comment:** Domestic wells in the area could be affected by the drawdown created by the pumping (water quantity) as well as the discharge into the mixing zone (water quality). The EA underestimates impacts to domestic wells.

Response: Drawdown observed during the tests in 1995 and 1996 was largely in the two major bedrock aquifers within the proposed project area. All bedrock drawdown was observed in a region approximately 12,000 ft east-west by 8,500 ft north-south, centered on the pumping wells and extending north under McDonald Meadows. The northerly extent of the drawdown in the bedrock reached the SE¼ of Section 31, T15N, R7W. Numerous wells outside the zone of drawdown, but well within the project area, showed no impact from the tests. Since the same bedrock wells used in 1995 and 1996 will operate in the 1997 tests, the drawdown impacts to both the bedrock and alluvial aquifers will be similarly limited. There are no domestic wells located within the zones of previously-observed drawdown.

4) **Comment:** The validity of the Minteq/Modflow models, used in the mixing zone analysis, are questionable. In fact, the validity of modeling in general is questionable.

Response: These models are commonly used assessment models developed by the U.S. Geological Survey and the U.S. Environmental Protection Agency. They are well-documented, standard tools for assessment of groundwater flow, transport and geochemical changes.

5) **Comment:** A safety factor should be included in mixing zone designation.

Response: A large safety factor was used in the mixing zone designation. The analysis assumed that metals would not attenuate in the aquifer and that dilution is the only mechanism of concentration reduction in the groundwater system. In reality, metals do attenuate readily in the groundwater system by mechanisms other than just dilution. In addition, arsenic and iron, when exposed to oxygen, precipitate out in an insoluble form at the bottom of the infiltration trenches, and is subsequently removed. Attenuation and precipitation were observed during the previous two pump tests, where metals concentrations in the alluvial aquifer were slightly increased only a short distance from the infiltration trenches.

- 6) **Comment:** We are concerned about the EA's superficial discussion on water quality.

Response: Impacts to water quality are discussed and analyzed in detail in the EA and Statement of Basis.

- 7) **Comment:** The EA fails to address all available alternatives. Two alternatives are not enough. Water treatment should be addressed as an alternative. We request that DEQ develop and analyze an alternative that requires SPJV to treat the pumped water so that all discharges meet water quality standards for human health and aquatic life at the point of discharge. Why is water treatment not required for the pump test discharge?

Response: The DEQ's rules implementing the *Montana Environmental Policy Act* (MEPA) provide that, in an EA, alternatives are to be considered only to the degree required by the complexity of the proposed action, the environmental sensitivity of the affected area, the degree of uncertainty as to the impacts of the action, and the need for mitigation to avoid significant impacts (*ARM 17.4.609*). Where the agency is very certain that impacts will not be significant and complex mitigating measures not needed, only minimal consideration of alternatives is required by the rule. In the case of the proposed pump tests, DEQ is very certain that no significant impacts will result, and few mitigation measures are necessary.

Further, DEQ lacks legal authority to require treatment of the well test discharge because the *Montana Water Quality Act* prohibits DEQ from requiring treatment "when the discharge is considered nonsignificant under rules adopted pursuant to 75-5-301." (*§75-5-305(1), MCA*) Discharges of water from water well tests during mineral exploration are designated as "nonsignificant" under both water

quality statutes (§75-5-317(2)(j) and (p)) and water quality rules (ARM 17.30.716(1)(h)). DEQ's MEPA rules only require consideration of alternatives that are "reasonably available", i.e., within the agency's statutory authority to implement. DEQ lacks legal authority to require treatment of well test discharges, so such an alternative need not be considered in the EA.

- 8) **Comment:** The EA fails to discuss all environmental impacts.

Response: The scope of an EA is determined by the significant issues of concern. After a thorough scientific review of all available data and issues, the agencies have concluded that no significant environmental impacts would occur to any natural resource. No additional pertinent information has been provided that would invalidate this conclusion.

- 9) **Comment:** Mixing zones are a hoax. Dilution doesn't matter since the pollution is still there. Aren't mixing zones tailored to accommodate the anticipated amount of pollution?

Response: Regardless of one's opinion on mixing zones, they are allowed under the *Montana Water Quality Act* and its administrative rules. A mixing zone cannot be granted by the DEQ if it would threaten or impair existing beneficial uses. The mixing zones granted for this project do not threaten or impair any existing beneficial uses.

- 10) **Comment:** The EA downplays the impacts to surface water flow regimes. The EA is lacking an adequate analysis of the impacts to surface water. For example, there is no analysis of the impacts of zinc on fish and aquatics.

Response: Impacts to surface water have been addressed in the EA and the DEQ has concluded that there would be no impacts to surface water from the pump tests. This determination is based upon the fact that no groundwater flow paths exist that would allow contaminants to migrate to gaining reaches of streams. There is no analysis of the impacts of zinc on fish and aquatics because: 1) the discharge water would not enter any surface water body, and 2) zinc concentrations in the discharge water are below the aquatic life standard, and pose no threat to aquatic life in the stream or hyporheic zone.

- 11) **Comment:** The amount of pumped water has increased each year.

Response: The maximum pumping rates authorized for the 1995 tests totaled

1,500 gallons per minute (gpm). The maximum authorized rates for the 1996 tests totaled 1,250 gpm, but the actual rates did not exceed 500 gpm. The testing program has proceeded in a phased approach. As more empirical data has been gathered, the designs of the tests (and the water management system for the proposed mining project) have been made more realistic.

- 12) Comment:** We are concerned about the cumulative effects of the mixing zone on the groundwater & river system.

Response: As is discussed on page 22 of the EA, all available data indicates that no measurable impacts have occurred as the result of past hydrological testing; therefore, no cumulative effects are predicted as the result of the proposed action.

- 13) Comment:** Why aren't the tests occurring during high water levels?

Response: Observations of hydraulic changes resulting from pumping and infiltration is optimal at mean and low flow conditions, which is most conservative assuming that less water is available for dilution and dispersion. Also, logistical considerations have favored starting the tests in the summer.

- 14) Comment:** The basis for the statement that no wetlands would be impacted needs to be presented.

Response: Wetlands have been delineated in the area and this information is contained in the mine proposal application. Facilities and disturbances for the pump test were located so that no wetland areas would be affected.

- 15) Comment:** It does not take a rocket scientist to know that arsenic, zinc, lead and manganese do not dilute in any amount of water, let alone biodegrade. Heavy metals such as arsenic and others do not become less toxic through mixing. A certain amount of arsenic, for instance, does not become less dangerous through dilution, it is still there, contaminating the food chain. What are the cumulative effects at higher trophic levels?

Response: Dilution is a mechanism acting in a groundwater or surface water system which reduces the concentration of a solution through mixing with water of lower concentration. Because the toxicity of a metal is related to its concentration, it follows that the lower the concentration, the lower the toxicity. The trace amounts of metals added to the

aquifers would not contaminate the food chain or be transferred to higher trophic levels because: 1) all metals in the discharge are below the aquatic life standards, 2) the infiltrated water would not enter surface water, and 3) the bioconcentration factors for the metals discharged are low.

- 16) **Comment:** The pump testing that would follow on the heels of such a permit would alter the as-yet insufficient baseline data against which future degradation will be measured.

Response: Baseline data has already been collected for the McDonald Gold Project. Moreover, the trace amounts of metals that would be added to the aquifers by the pump test discharge would not significantly alter the baseline situation.

- 17) **Comment:** The accumulation of heavy metal in the river-bottom will contaminate aquatic insects which contaminate the fish, and pose a health risk for all life.

Response: As no discharge to surface waters would occur, no metals would accumulate in the bottom of rivers.

- 18) **Comment:** Several state agencies and private citizens have already expressed concern over how this groundwater pumping will dewater the Landers Fork and upper Blackfoot Rivers, which are prime Bull Trout recovery areas. There is proof that Bull Trout travel up and down the Landers Fork to spawning redds in Copper Creek.

Response: Data from previous pump tests have shown that short term (6 months) pumping of wells completed in the bedrock does not dewater or affect the rivers. Therefore Bull Trout migration would not be impaired.

- 19) **Comment:** The discharge of this water is illegal under current state law. The role of the DEQ is to ensure compliance with current state law, not grant exceptions to it.

Response: The commenter does not specify what law they feel would be violated by the pump test discharge. However, the DEQ is certain that the pump tests are in full compliance with all applicable laws. The DEQ's interpretation of those laws was upheld by the District Court in litigation concerning the 1995 and 1996 pump tests. DEQ completely agrees that its role is to administer and enforce current state law. Where the law does provide exceptions under specified circumstances subject to agency discretion, it is DEQ's duty to exercise that

discretion reasonably and fairly, and to grant such exceptions as are consistent with the intent of the law.

Discharges of wastes into state groundwater from mineral exploration or mining operations regulated under mine reclamation laws do not require a groundwater discharge permit under the Montana Water Quality Act (§75-5-401(5), MCA). The proposed pump tests are exploration operations regulated under the Montana Metal Mine Reclamation Act (MMRA, Title 82, Ch. 4, pt. 4, MCA). The water quality act prohibits any person, including a person operating under an MMRA exploration license, from discharging wastes that would cause state waters to exceed water quality standards (§75-5-605, MCA). However, the law allows DEQ to determine compliance with water quality standards at the edge of a "mixing zone", rather than at the point of discharge, provided that the mixing zone does not threaten or impair any existing beneficial use of state waters, such as domestic wells or fisheries, and that the mixing zone meets certain requirements provided by administrative rule (§§75-5-401(6), 75-5-301(4), 75-5-103(14), MCA; ARM 17.30.501 through 518).

- 20) **Comment:** I am once again voicing my concern over the pumping tests and how they might affect my water well. My well, located about three miles north of this site, went dry during the July-August 1995 pumping tests. Please keep the local water users in mind while conducting the dewatering and other testing.

Response: Please see response to comment #3.

- 21) **Comment:** There are other mechanisms for these heavy metal contaminants to cause problems, as exemplified in the arsenic contamination of drinking water wells around the Milltown area. The Milltown example clearly teaches us that it is much cheaper to prevent pollution than it is to clean it up later.

Response: The Milltown dam site resulted from a very different set of circumstances than the proposed pump test. The Milltown problem resulted from historic discharge of metal-laden tailings into streams in the Butte area. These tailings were ultimately transported and deposited behind Milltown dam, where they remain a source of metal contamination. The pump test will not involve the discharge of tailings.

- 22) **Comment:** If they pump arsenic and other toxic metals into the Blackfoot River, isn't that in violation of our state water quality guidelines?

Response: No discharges would occur to the Blackfoot River, or any other surface water. Discharges would be directed to groundwater via infiltration trenches.

- 23) Comment:** The EA underestimates impacts to surface water quality in the Landers Fork and the Blackfoot because it assumes both are losing streams....Page 15 of their proposal states clearly that the Landers fork gaining reach extends some 4,000 feet downgradient of SW-44.L, and thus extends downgradient of the proposed Landers Fork infiltration site. Regarding the Blackfoot, page 16 of SPJV's proposal states that the groundwater elevations are sufficiently close to the stream during falling limb conditions that return of bank storage is possible along the blackfoot near surface water monitoring station SW-46B.....We request that DEQ re-examine the potential impacts to surface water quality and aquatic life in both the Landers fork and Blackfoot in light of these findings.

Response: The dominant southward gradient in the Landers Fork aquifer has been established during previous investigations. The gradient would direct groundwater from the infiltration site to the south. Water level and stream stage measurements throughout the 1997 rising and falling limbs verify the 1996 data indicating uniformly losing conditions at SW-15.L and in the confluence area. There is no likely flow-path for groundwater containing mixed infiltrated water to report up gradient or across the valley to a possible gaining reach on the Landers Fork. On the Blackfoot River, the seasonal hydrograph peaked in mid-May, 1997. Water level and stream stage measurements throughout 1997 rising and falling limbs verify the 1996 data indicating uniformly losing conditions upstream of Aspen Grove Campground. Between Aspen Grove Campground and the confluence, the 1997 data indicate that a return to uniformly losing conditions has occurred since the end of May 1997.

- 24) Comment:** The EA underestimates potential impacts to biologically important areas, in particular, the aquatic insects in the Landers Fork and Blackfoot hyporheic zones and the bull trout that migrate through and/or spawn in the project area streams....in light of these findings, we request the following: 1) DEQ re-evaluate the effects high zinc and other metal concentrations in the discharged water will have on the diverse and abundant stonefly populations in the alluvial groundwater system; 2) DEQ prohibit any discharges to groundwater that exceed aquatic life standards ; and 3) DEQ deny any pump test discharges until a) all existing hyporheic zone invertebrate samples are analyzed, evaluated, and presented, and b) the additional

hyporheic zone sampling recommended by Stream Ecology Center be completed, analyzed, and evaluated.

Response: A re-evaluation of the effects of the discharge water on aquatic insects in the hyporheic zone is unnecessary because the concentrations of all metals (including zinc) in the discharge water would be below aquatic life standards. Zinc exceeds the aquatic life standard (0.16 mg/L at hardness of 166 mg/L) only in pumping well WW-96-008. However, when the discharge from this well is mixed with water from wells WW-93-005 and WW-93-006, the resultant zinc concentration would be below the aquatic life standard. Because no aquatic life standards would be exceeded in the discharge water, no additional sampling or evaluation of the hyporheic zone is warranted for this proposal.

- 25) **Comment:** The EA underestimates the likely impacts the pump tests will have on surface water flow regimes in the Landers Fork and Blackfoot..... This leakage could result in two significant impacts: 1) increasing the downwelling effect in losing reaches of the Blackfoot and Landers Fork, and 2) completely dewatering losing reaches in the Blackfoot and Landers Fork during bull trout migration and spawning.

The significant impacts that downwelling can have on fish in these streams was demonstrated last fall when several hundred fish, including a number of bull trout were trapped and frozen, and died in a downwelling area on the Landers Fork. While no data was collected to confirm or deny the suspicion, many are concerned that lowering the water table during the pump tests increased the downwelling effect, and consequently, killed the fish.

Response: Because more water will be added to the alluvial aquifer at the infiltration sites than is removed by leakage, the major overall effect of the tests will be to cause slight increases in water levels, or slight delays in the rate of seasonal declines in water levels. No drawdown in the alluvium was observed during the 1996 tests. In the 1995 tests, drawdown in the alluvial aquifer overlying the Blackfoot silicified zone dissipated 1,800 feet from the pumping well and 600 feet from the Blackfoot River. On the Landers Fork side, less than 1/2-foot of drawdown was observed 1,800 feet from the pumping well and 300 feet from the Landers Fork. These amounts of drawdown would have little or no impacts to the surface water flow regimes in either river. An investigation of the fish kill incident during the winter of 1996 conducted by The Montana Department of Fish, Wildlife & Parks, U.S. Forest Service, and DEQ concluded that the pump test was not

a factor.

- 26) Comment:** The EA underestimates potential impacts to drinking water supplies in the upper Blackfoot Valley.....We request the DEQ re-evaluate the mixing zone designation, taking into consideration dispersion of infiltrated water, and to re-evaluate potential impacts to the domestic water supply well just outside the Landers Fork mixing zone....

Response: This is addressed in the flow and transport modeling presented in the EA.

- 27) Comment:** We request that DEQ also require monitoring wells at the down-gradient end of each designated mixing zone. These monitoring wells will help determine if the pump tests cause water quality changes at the end of the mixing zones.

Response: Based upon observations from previous pump tests, metals are not expected to migrate very far away from the infiltration trenches. Therefore, the monitoring requirements described in the EA are adequate. Contingencies are also described on page SB-12 in the Statement of Basis that address violations at the mixing zone boundary, or an observance of water quality trends that indicate a possible exceedence of standards at the mixing zone boundary. A domestic well located near the confluence of the two rivers has been added to the required monitoring program at the owner's request.

- 28) Comment:** We request that DEQ require SPJV to install monitoring wells between the infiltration trenches and the Blackfoot River and Landers Fork.....Monitoring groundwater depth and quality between the trenches and rivers will help to determine whether infiltrated water is moving towards, or parallel to, the Blackfoot River and Landers Fork.

Response: Please see response to comment #23.

- 29) Comment:** We request the department closely inspect the construction and completion of all monitoring wells installed for the project. In particular, we believe DEQ should assure that all monitoring wells are screened in the upper 5 to 20 feet of the alluvial aquifers. In the past, monitoring wells have been screened over the intervals as much as 60 feet - a situation that could mask water quality changes in the upper few feet of aquifers.

Response: The required compliance wells located 100 feet downgradient of the infiltration trenches will be screened in the upper 20 feet of the

saturated zone. While it is impractical for DEQ inspectors to be continuously on-site throughout the entire construction and testing phases, DEQ personnel would inspect the project area on a frequent basis for compliance with the permits, permit stipulations and all applicable laws and regulations.

- 30) **Comment:** We request DEQ require SPJV to monitor water quality in the actual trenches at the same frequency as the discharge pipes. The EA predicts significant metals reduction from precipitation and adsorption mechanisms within the trenches. Monitoring water from the discharge pipes, the trenches, and in the groundwater downgradient of the trenches will help to determine if these mechanisms are working during this year's tests.

Response: Monitoring the chemistry of the discharge to the infiltration sites, and monitoring of the groundwater down gradient of the trenches within the mixing zones, are sufficient to assess the predicted mechanisms of metals reduction. During the 1997 tests, SPJV would also collect selected data to evaluate metals concentration changes, if any, within the infiltration water after discharge to the trenches.

- 31) **Comment:** We request DEQ require SPJV to monitor water quality and flow at station SW-43L. This location is critical to monitor because one of the mixing zones intersects the Landers Fork in this area, and because it represents the downgradient boundary of that mixing zone.

Response: Station SW-43.L has been added to the monitoring program, with a biweekly frequency.

- 32) **Comment:** Require SPJV to monitor water levels in these piezometers every other week to determine how the aquifer drawdowns are affecting the hydraulic gradients between the alluvial aquifers and the surface water streams. In addition, DEQ should require SPJV to install and monitor nested piezometers adjacent to the Landers Fork infiltration trench, near SW-44L, and in the silicified zone near the Blackfoot infiltration site 3.

Response: SPJV would monitor drawdown in wells and piezometers in the silicified zone and around the trench during the test. Routine monitoring of the piezometers at the confluence is ongoing.

- 33) **Comment:** The proposed monitoring plan only requires SPJV to sample the domestic water supply well adjacent to the Landers Fork mixing zone once every three months. This is inadequate. DEQ should increase

this requirement to biweekly sampling to assure that the well owner can be promptly notified if discharges from the pump tests affect water quality in the well.

Response: The monitoring frequency of the domestic well has been changed from quarterly to biweekly.

- 34) **Comment:** The proposed monitoring plan has no requirement for monitoring aquatic life, and in particular bull trout migration and spawning, during the pump tests.....DEQ should assure the Landers Fork and Blackfoot are surveyed for bull trout during the pump tests. If bull trout are found constructing redds in, or migrating through, the project area streams, the Department of Fish, Wildlife & Parks should be notified immediately. If DFWP decides it is necessary to protect the spawning and/or migrating bull trout, the pump tests should be stopped.

Response: Surveys of Bull Trout spawning behavior in the project area indicate that spawning begins at the end of August and ends at the end of September. Bull Trout are not known to spawn in the project area, but instead use the Landers Fork and Blackfoot Rivers as migration corridors to reach spawning areas upstream of the project area. The monitoring plan has been modified to include an assessment of the radial extent of any mounding or drawdown in the alluvial aquifers to determine if the natural interactions between groundwater and surface water are being affected. This assessment would be submitted to DEQ when steady-state conditions are attained. As long as these natural interactions are not affected to any great extent, migration and any possible spawning activity by Bull Trout would not be affected.

Errata Sheet for Environmental Assessment & Statement of Basis

Please note the following corrections for the May 1997 Environmental Assessment and its appended Statement of Basis:

- **Page 3, Section F, 1st Paragraph, Last Sentence:** May 5, 1997 should be May 30, 1997. In fact, a timely appeal of this decision has now been filed with the Montana Supreme Court by the Montana Environmental Information Center and Womens' Voices for the Earth.
- **Page 5, Last Paragraph in Section G. 1.:** The word license is misspelled in sentences 1 and 2.
- **Page 20, 2nd Paragraph, 3rd Sentence:** July should be replaced with June.
- **Page 25, References Cited:** The full reference for the Hyporheic Zone study mentioned on **Page 14** is -

Assessment of the Hyporheic Zone of the Upper Blackfoot River Basin in the Proximity of the Proposed McDonald Gold Project, Preliminary Report, 17 February 1997. Idaho State University, Boise.

- **Pages SB-5 and SB-6, Tables 1 and 2 (Statement of Basis):** The heading Blackfoot Sites #1 and #2 in both Tables 1 and 2 should actually read Blackfoot Sites #2 and #3. (There would be 3 infiltration trenches and three associated mixing zones. Site #1 would be in the Landers Fork alluvium, and Sites #2 and #3 would be in the Blackfoot alluvium.)
- **Page SB-7, Last Paragraph, 1st Sentence (Statement of Basis):** The reference *Domenico and Schwartz (1990)* was followed by a superscript (1), but the corresponding footnote reference was inadvertently omitted. The full reference should be:

Domenico, P.A. and Schwartz, F.W., 1990. Physical and Chemical Hydrogeology, John Wiley & Sons.

- **Page SB-11, Self Monitoring Requirements (Statement of Basis):** Add surface water monitoring site SW-43.L and the Tulloch domestic well (NW¼ of Section 13, T14N, R8W), both located near the confluence of the Landers Fork and the Blackfoot Rivers, to the list of required monitoring locations. Also add an assessment of the radial extent of drawdown and mounding in the alluvial aquifers to be submitted to DEQ when steady-state conditions have been attained. The required compliance wells located 100 feet downgradient of the infiltration trenches

will be screened in the upper 20 to 30 feet of the saturated zone. The required monitoring frequency of the domestic well, located in the NE¼ of Section 12, T14N, R8W, has been changed from quarterly to biweekly.